

A PRELIMINARY NOTE ON THE PAPILIONOIDEA (LEPIDOPTERA) OF TUGLO WILDLIFE REFUGE, NEW SOUTH WALES

By C. N. Smithers

The Australian Museum, 6-8 College Street, Sydney, 2000

Abstract

A total of 35 species of Papilionoidea (butterflies) is recorded from Tuglo Wildlife Refuge, situated about 10 km south-west of Mount Royal, New South Wales. Data on seasonal flight periods based on three year's observation are given and the local status of each species is tentatively indicated. Lycaenids are very poorly represented and satyrine species have been found to have very regular seasonal appearances.

Introduction

Tuglo Wildlife Refuge is a privately owned property of 214 hectares, situated about 10 km south-west of Mount Royal and about 49 km north of Singleton, New South Wales (32°14'S 151°16'E). It is located on a ridge forming an outlier of the Mount Royal Range with altitudes ranging from 760 m to 320 m. The Refuge is of some interest because of its intermediate position between Barrington Tops to the north and the low lying Hunter Valley to the south.

This paper is based on observations made on the butterflies (Papilionoidea) of the Refuge; the skippers (Hesperioidea) have not been included as observations on them are continuing.

The environment

Apart from a relatively flat, higher altitude north-eastern area of about 24 hectares, most of the property consists of an irregular, steep-sided ridge running more or less east-west, descending in a series of ledges or platforms to the western boundary formed by Falbrook, a tributary of Glennie's Creek which, in turn, drains into the Hunter River. Steep-sided gullies run to the north-west and south from the ridge.

Little meteorological data is available for the area; the rainfall was in excess of 1300 mm in 1977 and 1840 mm were recorded in 1978. Winds are mainly from the north-west and the south-east, the former being responsible for the hotter, dryer conditions on the northern slopes in summer and the harsh conditions in winter; the south-east winds provide a cooler influence in summer. The effects of these winds is clearly seen in the varied vegetation pattern; the northern slopes support dry sclerophyll and the sheltered southern slopes support rain forest and wet sclerophyll. Summer temperatures are high, exceptionally as high as 40°C; frost is frequent in winter and light snowfalls occasionally occur.

The major plant communities include rain forest, wet sclerophyll, eucalyptus woodland, dry sclerophyll and grassland; there is a small cultivated

horticultural area. The boundaries between the main vegetation types are remarkably sharp in most cases.

Methods

Between 28th August, 1976 and 16th April, 1979, 105 visits were made to the area; most visits were of two days (weekends) but several were of much longer duration (up to a fortnight). On each visit a record was kept of the butterflies in flight. A small reference collection is housed at the Refuge and will eventually be incorporated into the Australian Museum collections.

For this paper the data has been summarized on a seven day basis by dividing the year into seven day periods and combining the records for each equivalent period each year. For example, species observed between the 2nd and 8th December inclusive are recorded for that period irrespective of the year or number of observations. The first period is arbitrarily taken as 1st-7th July. In this system leap years are ignored so that the period 24th February to 2nd March has an extra day in leap years. The single day remaining (365th) after dividing a year into seven day periods is always included in the period 23rd-30th June. By summarizing records in this way those for one year reinforce those for another to provide broad seasonal patterns. This gives a more refined picture than records presented on a monthly basis. Although possible, it is less practical to refine the system to daily records and doing so would confer little advantage here over summary by seven day periods. Data are, however, originally recorded on a daily basis and are available at that level if required. In the present series of 105 visits there is only one seven day period during which observations were not made, i.e. 12-18th May.

Results

Thirty five species of Papilionoidea have been recorded from the Refuge. The number recorded in flight in each seven day period is given in Fig. 1. The highest number for any one period is 23 (early January) and there is virtually no flight activity through most of June and July. Prior to the end of September few species are flying and the number drops during the latter part of April and during May. Activity increases during October and November to reach its peak from late November to early January, with an indication of a lesser peak of activity in late March and early April apparently due to adult emergence in those species which have two distinct generations annually.

Observations made so far are insufficient to establish the status of each species for the area; tentative conclusions are indicated as follows:— resident species (R) with some stage present at all times of year; vagrant species (V) of which an occasional specimen enters the area; migratory species (M) of which populations enter the area on a regular seasonal basis but do not breed and intinerant species (I) of which specimens arrive on a regular seasonal basis and breed, but the species is not present at all times of the year; this implies that the populations leave after breeding. The tentative nature of this status determination must be stressed as little observation other than on adult occurrences has so far been made.

Aust. ent. Mag. 7(6), February, 1981



The species recorded in flight in each period are given in Fig. 2. All except three species (91% of the total recorded) had made their appearance by the first week in January. Of these, two were probably vagrants (*Euploea core* and *Eurema brigitta*); only the third (*Heteronympha penelope*), which appears in mid February, can be considered a resident of the area.

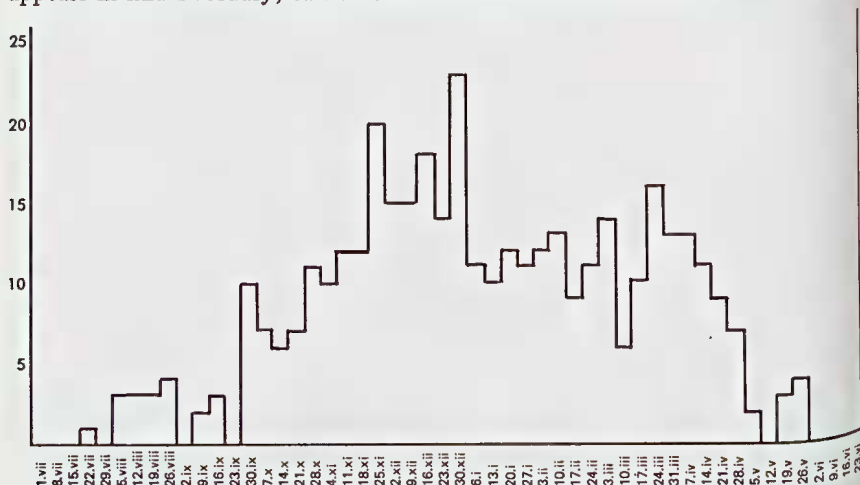


Fig. 2. Number of species in flight in each seven day period.

PAPILIONIDAE

Graphium macleayanum (Leach) flies from October to May and is probably present throughout the year whereas *G. sarpedon* (L.) is a casual visitor (only one sighting). *Papilio aegaeus* Don. and *P. anactus* Macl. are not common and their relatively late appearance, in December, suggests that they move into the area from elsewhere; if pupae are overwintering in the area an earlier appearance would be expected. *P. demoleus* (L.) has been seen only as occasional individuals, usually flying very fast to the N or NE; a NE migration was noted on 13-14th November, 1976 involving many specimens.

PIERIDAE

Anaphaeis java (Spar.) appears at two distinct periods: it is a migrant and is usually clearly moving through the area; only occasionally have specimens been seen to remain in a restricted area for any length of time. *Appias paulina* Cram., *Catopsilia pyranthe* (L.) and *Delias aganippe* (Don.) have each been seen on only two occasions. *Delias nigrina* (F.), on the other hand, is clearly resident and one of the earliest species in flight. *Elodina padusa* (Hew.) is not common and has not been seen later than the end of December; its status is uncertain. *Eurema brigitta* Cram. has been seen only once, in February, but *E. smilax* (Don.) appears to have two distinct periods of occurrence, one early in the season and the second as late as April. *Pieris rapae* (L.), likewise, is commonly present from November to December but after that has not been recorded until April. The only certain all year round resident pierid is *D. nigrina*.

NYMPHALIDAE – DANAINAE

Both *Danaus plexippus* (L.) and *D. chrysippus* (L.) are absent during winter, neither being common until November although occasional specimens may occur earlier. Incoming adults establish breeding populations on *Gomphocarpus fruticosus* L. but there is little evidence of either species after mid June. *D. hamatus* (MacL.) is an occasional visitor and *Euploea core* (Cram.) has been seen only once.

NYMPHALIDAE – SATYRINAE

Most species of this subfamily occur at fairly high population levels and there is a distinct and remarkably regular sequence of appearance of species although *Tisiphone abeona regalis* Wat. occurs in low numbers over very restricted areas. *Heteronympha merope* (F.) is the first to appear in October and is present until late April. The females are much less evident than the males early in the season but can be found in large numbers sheltering under banks, near logs or in other shady situations until after the number of males has declined in mid January. Female flight activity is especially conspicuous from mid February until late March with a few specimens seen as late as mid to late April.

In early and mid January females are frequently seen settling briefly on water, such as dams and deep pools in rivers, and taking off again. This habit appears mainly to coincide with the break up of the groups which have been occupying sheltered positions during the hotter periods of summer. Small numbers of *H. mirifica* (But.) are in flight from November but this species has disappeared by early January. *Hypocysta metirius* But., *Tisiphone abeona regalis* and *Ypthima arctoa* (F.) all appear at about the same time in mid November, the two last-mentioned disappearing by mid December but reappearing again in early March. *T. abeona*, however, appears to be in flight for a very short period whereas *Y. arctoa* may continue into May. *Geitoneura acantha* (Don.) appears in early December and is obvious for only a short period, until the end of January at the latest; shortly after its appearance, i.e. in mid December, *G. klugii* (Guer-Men.) appears and remains in flight until the end of April. Finally, *H. penelope* Wat., the latest satyrine species, does not appear until early February and is in flight until the end of April. The Satyrinae are remarkable for the regularity of their appearance, each species appeared within a day or two of the same date in each of the three years covered by the present observations.

NYMPHALIDAE – CHARAXINAE

Only a few specimens of *Polyura pyrrhus* (L.) have been seen, mostly in January.

NYMPHALIDAE – NYMPHALINAE

Precis villida (God.), *Vanessa kershawi* (McCoy) and *V. itea* (F.) are sometimes very common, especially the two *Vanessa* species. They are the earliest species to appear in numbers and can be seen in flight until the end of April. Only *D. plexippus* and *D. chrysippus* occur in any numbers later than the *Vanessa* species.

NYMPHALIDAE – ACRAEINAE

Acraea andromacha (F.) has been seen on only a few occasions.

LYCAENIDAE

The low number of lycaenid species recorded so far is remarkable. The only common species is *Zizina otis* (F.) which appears in numbers in November and has been seen as late as June although the major part of the population has disappeared by mid to late April. At times vast populations occur in pastures and open eucalypt forests, wherever clover is abundant. *Candalides absimilis* (Feld.), *Lampides boeticus* (L.) and *Jalmenus evagoras* (Don.) have been uncommon during the years of observations.

Discussion

It is interesting to compare the results of the observations at Tuglo with the records for the Australian Capital Territory accumulated by Kitching *et al.* (1978). Considering the great differences in area involved the faunas are surprisingly similar, except for the lycaenids.

The papilionid faunas are identical in both localities.

The pierids are very similar except that Tuglo has *Appias paulina* (occasionally) and *E. brigitta* (occasionally) whereas A.C.T. has *Delias harpalyce* (Don.) and *D. argenthona* (F.) (occasionally). *Anaphaeis java* appears a little earlier in A.C.T.; there is a second, short April appearance, as at Tuglo.

The nymphalines are similar in the two areas but the danaines, *D. plexippus* and *D. chrysippus*, fly until much later at Tuglo and *D. plexippus* does not appear until much later than *D. chrysippus* in A.C.T. The satyrines differ considerably with many more species in A.C.T. This is due to the presence of the higher altitude species (above about 1200 m) and the "local" species *Heteronympha paradelpha*. The altitudinal differences are emphasized by the presence on Tuglo of a few "lower altitude" species, such as *Ypthima arctoa* and *Hypocysta metirius* which are not recorded by Kitching *et al.* (1978). *H. merope* seems to appear earlier and *H. penelope* later at Tuglo than in A.C.T. so that the two species coincide in flight for a greater period there but with *H. merope* being in evidence for a shorter period than at Tuglo. The remaining nymphalids are similar in the two areas but in general show a slightly longer flight period at Tuglo.

The outstanding difference in the faunas is seen in the lycaenids in which there is an abundance of species (25) in A.C.T. but only four so far recorded at Tuglo, of which only one is common. This can be seen as a direct outcome of lack of host plants at Tuglo (even *Acacia* species being uncommon) and the lack of high altitudes.

Acknowledgements

I would like to thank my wife Aletta and sons, Graeme and Hartley, for assistance in accumulating records on which this note is based.

Reference

- Kitching, R. L., Edwards, E. D., Ferguson, D., Fletcher, M. B., and Walker, J. M. 1978. The butterflies of the Australian Capital Territory. *J. Aust. ent. Soc.* 17: 125-133.